DOCUMENT RESUME

ED 316 191 IR 014 179

AUTHOR Walker, David D.
TITLE Strengthening the Impact of International Cooperation.
PUB DATE Apr 89
NOTE 10p.; Paper presented at the International Congress on International Co-operative Design and Development (Paris, France, April 12-21, 1989).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Courseware; *Educational Cooperation; Elementary Secondary Education; *International Cooperation; Models
IDENTIFIERS European Economic Community; *Software Development

ABSTRACT

This paper begins by describing four levels of educational cooperation: software design; support material development; development systems environment; and target classroom system. The main stages in the software development process are identified, and cooperative projects sponsored by the European Economic Community, including the Euryclee information network and summer institutes on software design, are discussed. The impact on cooperation of resource availability and national languages is then briefly considered. Goals for cooperative projects are noted, and a procedural model including six elements is presented: (1) development of proposal; (2) initial meeting pattern; (3) operational objectives; (4) staffing; (5) national working groups; and (6) evaluation. (MES)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED316191

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

INTERNATIONAL CO-OPERATIVE DESIGN AND DEVELOPMENT

THEME 5.3 Strengthening the Impact of International Cooperation

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
David D. Walker

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

DAVID D WALKER

Depute Director
Scottish Council for Educational Technology (SCET)

Scottish Member of the
International Council for Educational Media (ICEM)

IR014179

CONTENTS PAGE

1.0	Overview	3
2.0	Levels of Co-Operation	3
3.0	Software Development	4
4.0	An Example of a Co-Operative Structure	4
5.0	The Case for Co-Operation	7
6.0	A Project	7
7.0	A Procedural Model	8

1.0 OVERVIEW

Educational software is the driving force for New Information Technologies in Education. Co-operation is essential. The sharing of educational design structures and the benefits of the exchange of experiences would help the international pupil population, the teaching professions and education administrators. But is it possible? Does it happen at present even within a single country? And can it be achieved internationally? We must answer yes if we are to take advantage of the full educational and economic benefits of new technology. The secret of successful co-operation is through the identification of common areas of interest and need, the identification of the levels of co-operation and a realistic appraisal of constraints.

National Programmes: Many countries have embarked upon New Information Technology Programmes. It is inevitable that the nature of such programmes differs across each country, or indeed even within a specific country, depending upon the economic, political and cultural philosophies. These differences are natural and do not fundamentally affect educational principles. Rather, they affect the nature and speed of implementation. We must, however, ensure that development and educational experiences are shared between countries. Development programmes can all too often be expensive in cash terms as well as personnel and other resource provision.

Co-operation: There are strong educational arguments to support a programme of experience exchange. There are also strong technical and economic reasons. It is unlikely that any one country could release all the necessary resources to evaluate the many new curriculum software developments, computer systems, peripherals, software tools and related teaching strategies.

One solution: A solution path suggested here in this paper is that countries can benefit from the experience of international co-operative projects set up through the EEC. It is suggested that an extension of the community's summer universities system can help move towards a co-operative framework. It is suggested that the process be carried forward to incorporate an international team to determine a common core for educational design. Inevitably copyrights and payments become issues associated with developed software, but if most countries through UNESCO participate in such a collaborative project then the designs and the software fruits would be the "property of all" benefitting all children.

2.0 LEVELS OF CO-OPERATION

Co-operation can take place at a number of levels: the educational software design level; the educational support material development level; the development systems environment level; and the target classroom system level. Co-operation between countries is currently considered to be most effective, both educationally and in cost terms, through the higher levels of development; levels where the software and courseware educational design criteria can best be developed and evaluated and subsequently incorporated into training programmes.

Software Design: The educational software design level involves: the identification of possible areas of development priorities; the consultation and negotiation processes to establish agreed priorities; the encouragement to the educational bodies to develop pre-specifications for software designs; the selection of pre-specifications for further development work; the establishing of working groups to take the pre-specifications towards full specifications; the design and development of modules for teacher training; the design and development of modules for technician training; the design and development of modules for educational programmer training.

Support Material: The educational support material development level involves: the development of associated teachers' notes to support the software packages; the development of associated pupil notes to support the software package; the development, where necessary, of technical notes; the identification of additional support materials from existing resources; the development of additional support materials, where such materials do not at present exist; the identification of support activities both within and outwith the classroom to enhance the software package and to consolidate the teaching process.

Development Systems Environment: The development systems environment level involves: systems design and development philosophy; the design of the operating environment; common software development tools; common development protocol structures; the development of standard sub-routines; the development of technical software diagnostics.

Target Classroom System: The target classroom system level is the level visible to the school user of the developed software and courseware and involves: the use of standards to create the philosophy of user friendliness; standards which allow a user to operate hardware and software through a common application model; the operational educational evaluation process; the identification and evaluation of emerging teaching strategies; the technical quality of the software; the identification of possible extensions or new developments.

3.0 SOFTWARE DEVELOPMENT

The procedures for the development of high-quality educational computer software have now matured. It may be worthwhile to identify the main stages of the process in some detail.

The Package: In its most commonly implemented form a software package consists of a computer program or programs, notes for users and technical documentation. A full and integrated package may also include external educational support materials and classroom/outside activity experience.

Stages of Development: It can be appreciated that the production of a package normally means progress through a number of stages: program pre-specification - an initial brief statement of objectives and target information; program specification - an extension to the pre-specification, a statement of educational purpose, a conscious choice of the method of learning and a description of what the computer is to do; designing the program and coding it; writing notes for users and program documentation; field testing and subsequent de-bugging of code and notes.

4.0 AN EXAMPLE OF A CO-OPERATIVE STRUCTURE

Euryclee: In 1983 an EEC resolution was passed proposing that a specialist information network be established. This network, "Euryclee", is now becoming a very effective and influential organisation. Euryclee's primary function is to support Community action defined in the formal work programmes.

Each member state has a head of Euryclee who is responsible for information and, in most cases, is also responsible for the implementation of national strategies associated with their country. Although Heads of Euryclee only meet about four times a year they are in communication daily through electronic mailing systems.

In order to effectively and efficiently progress any project within a country it is frequently necessary to request and analyse the experiences to date from other countries. Such requests are appropriately dealt with through Euryclee.

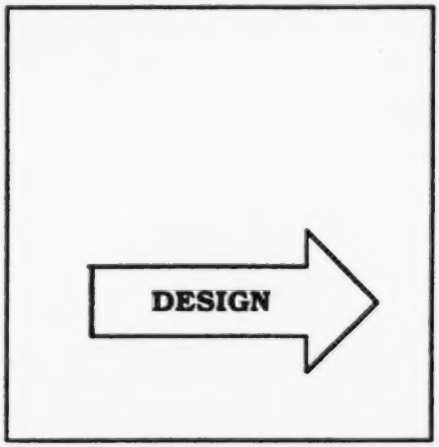
EEC Software Development: The European Community has conducted two Summer Universities in an attempt to establish a mechanism for co-operation and a model for design portability.

It was considered necessary to provide a framework for educationists to co-operate and exchange software models with the restrictions imposed by technology.

In 1987 the EEC Summer University on Software Development was held in Glasgow under the auspices of SCET. This software development laboratory was, in effect, spread over a two year period but concentrated the major coding exercise over a seven day period. Working groups had been set up in each of the member states of the EEC with the task of generating software design specifications and in July 1987 development teams from all the member states came to Glasgow where some 12,000 lines of coding were prepared. It was during this phase that common design models and practical development tools were evaluated in an attempt to find the "Europeanness" of individual software specifications.

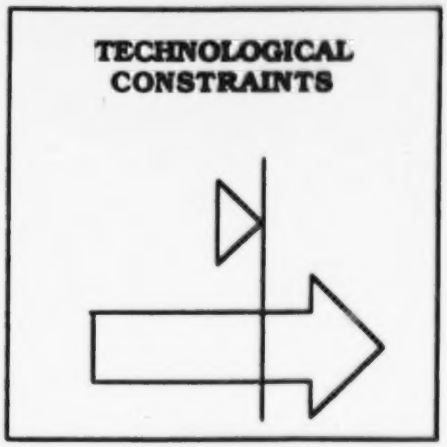
Work on the Summer University continued for a further year after the intensive event in Glasgow and eventually produced some 13 pieces of software, made freely available throughout the member states, allowing for the first time identical pieces of software to be evaluated in each member state in its own mother tongue, giving the opportunity for each member state to assess and evaluate the use of a common set of programs in their schools.

EEC Common Educational Core: This process of trying to determine the core co-operative element in software design across member states was carried a stage further at the Summer University held in Paris in 1988 which was based upon the hypothesis that software design might be considered as a vector.



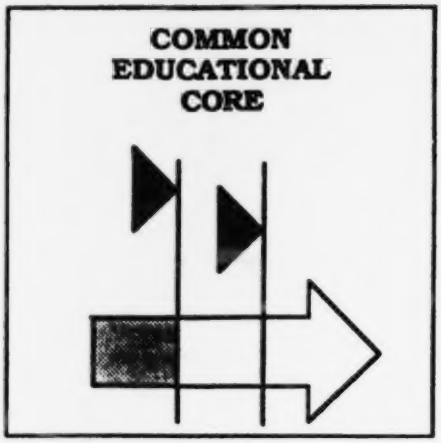
Design groups in each of the member states were given the task of designing a software specification for a curricular application. The teams were asked to design the software specification without giving consideration to any specific piece of hardware. The design groups were also encouraged not to be constrained by current levels of technology but to look further afield and give some expression of requirements for the future.

At a later stage hardware constraints were then imposed through what was called the "Eurotopian microcomputer system" being somewhat of a futuristic hybrid of systems currently in use throughout Europe. Attempts were made to determine the position on this hypothetical vector where the original educational design had to be modified in light of the hardware technological constraints.



Further attempts were made to determine once more the position on this hypothetical vector where changes in the design would have to be imposed according to individual member states' curriculum or cultural needs.

Naturally, such a study has given rise to an attempt to determine a methodology in order that all member states can share, to the maximum degree, the design of educational software.



5.0 THE CASE FOR CO-OPERATION

Co-operation at the educational and support materials levels will ensure an economic transference of educational experiences and will enable all countries to advance through co-operative efforts.

Levels of Resources: Education will always reflect the resource availability and priorities within any particular country. One purpose of co-operation would be to ensure that all countries would benefit from collective research and development, irrespective of current levels of resources.

Language: The adoption of a co-operative framework would include the evaluation of a common software development language. This can be considered as a technical problem and is not expanded further at this stage.

The problems of national languages may be considered both technical and cultural. It is possible, through the adoption of standards, to reduce the problem of national languages. One example may be that all screen text be embodied within a separate text file and not directly within the code of the program. This would require a country or institution wishing to express the text within a computer program in the national language merely to provide a text file.

This does not, however, solve the cultural or in some instances the curriculum transfer problems.

6.0 A PROJECT

The aim of a co-operative project would be to provide the technical, educational and dissemination framework for educationists at all levels across countries to exchange educational experiences of NIT and to foster further co-operative projects.

Overview: The development of a co-operative project would require both series and parallel activities to be instigated. A simple procedural model would involve:

a) The agreement in general principle to set up, initially, a small team to evaluate the proposal and to determine the immediate practical steps which could be undertaken within a pilot review.

b) The agreement to support an executive research and development programme of interchanges.

c) The finalising of the project definition and operational guidelines.

d) The identification of a project director, support team and external evaluator.

e) The identification of a working group structure.

f) The identification of the reporting and evaluating mechanism.

Collaboration: If such a project were adopted it need not involve heavy hardware costs. It would require people with the highest motives and motivation to enhance children's education through the creation of a framework which would remove technological barriers to educational experiences.

Practical Goals: The ideal model for a co-operative project would be co-operation at all four levels: software design, support material development, systems environment and at the classroom level. The principle goal of such a co-operative project would be the exchange of expertise and experiences towards an economic focus for software development, economic in terms of total resource allocation across countries and economic in terms of capitalising on the current experiences of New Information Technologies.

7.0 A PROCEDURAL MODEL

Development of Proposal: All proposals for education development must, by the nature of the education, be subsets of a continuous development model. It must always be necessary to define any proposal to accommodate resource, time and state of the art conditions. It would be necessary, therefore, to set up a small team to evaluate the issues and to undertake a pilot review. A further responsibility of this small group would be to rough tune the proposals in light of anticipated constraints and resources, bearing in mind that some countries may have already allocated physical resources and finance to evaluate their New Information Technology programmes.

Initial Meeting Pattern: It would be anticipated that one action coming from this group would be the organisation of a series of meetings between the group and the relevant decision makers from the participating countries to discuss the possible operational models.

Operational Objectives: Given the above actions it would then be appropriate to finalise the project proposal by clearly defining the operational objectives and by defining the guidelines with respect to budget, timescales, scope and measurement criteria.

Staffing: A project as important as this would require a project director appointed for the duration of the project. The nature and number of the support team would depend on the final project definition. Similarly, the siting of the project staff would depend on the project definition.

National Working Groups: It is anticipated that each participating country would wish to set up a national working group to advise and to assist the central team. The establishment of a working operational model to ensure the correct input and recognition of such national working groups would be the responsibility of the project director through the project committee.

Evaluation: It is accepted that evaluation should not merely be carried out for the purposes of an evaluation exercise. From experience once a project team endeavours to carry out tasks set within the context of new technology, and normally within tight timescales using limited resources, the objectivity of the team is directed through narrower limits and there is a need for supportive evaluation. The project would require two or more evaluators who should be considered as complementary to and supportive of the project team, advising and giving direction during the project rather than producing a summative report on completion of the project.